

1 CLAIMS

2 I claim:

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4 1. A device for supporting a body or a portion thereof,

5 comprising:

6 a foam mattress, cushion, seating pad or other structure  
7 containing cutout portions or otherwise designed or configured  
8 to reduce local stresses on a supported body, reduce cross  
9 contamination between a patient and the surroundings, and  
10 reduce the incidence of dust mites into the support system;  
11 a bladder or membrane impervious to gases or other fluids,  
12 completely encasing said mattress, cushion, seating pad or  
13 other structure;

14 a passageway or other means to allow and control the  
15 ingress and egress of a gas or other fluid into or out of the  
16 pores and/or vacant regions within or around the materials  
17 encased by said bladder or membrane; and  
18 optionally, a pressure/vacuum pump to allow continuous  
19 variation of the fluid pressure within said bladder or  
20 membrane.

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22 2. A device according to claim 1 wherein the encased material  
23 comprises a foam mattress in which portions of the support  
24 material have been removed or omitted in one or more selected  
25 regions of the material, and the sides of the opening thus  
26 formed are such that they slope outward and downward from the  
27 center like a truncated cone or a bell-shaped opening.

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2   3. A device according to claim 1 wherein one or more of the  
3   edges of the mattress, cushion, seating pad or other body  
4   support surface is undercut such that the edge tapers inward  
5   toward the bottom of the mattress, cushion, seating pad or  
6   body support element.

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8   4. A device according to claim 1 wherein said mattress,  
9   cushion, or seating pad is formed from a convoluted foam  
10 material.

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12   5. A device as in claim 1 wherein said mattress, cushion, or  
13   seating pad is formed from a convoluted foam material and said  
14   convoluted foam material is inserted with smooth side upward  
15   and one or more cut-outs are made for the purpose of reducing  
16   local stresses on the body or sections thereof.

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18   6. A device according to claim 1 wherein the encased material  
19   provides for reduction of localized stresses by a modular  
20   construction technique using different types of foam material  
21   in selected regions to form a composite foam mattress.

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23   7. A device according to claim 1 wherein the encased material  
24   provides for reduction of localized stresses by a modular  
25   construction technique using different types of foam material  
26   encased in individual membranes in selected regions to form a  
27   composite foam mattress.

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2   8. A device according to claim 1 wherein said bladder is  
3   permanently sealed to prevent any escape or replacement of the  
4   fluid contained therein.

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6   9. A device according to claim 1 wherein said bladder is  
7   enclosed by a Ziploc® or similar fastening means.

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9   10. A device according to claim 1 wherein the encased  
10 material comprises a seat cushion and wherein said seat  
11 cushion contains provisions for localized relief of stress  
12 comprising one or more regions where material has been removed  
13 or omitted selectively from said seat cushion.

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15   11. A device as in claim 1 where a variable orifice is  
16   contained within the surrounding membrane to control the rate  
17   of gaseous exchange from within the membrane to outside of the  
18   membrane and vice versa.

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20   12. A device for supporting a body or a portion thereof,  
21   comprising:  
22         a foam mattress, cushion, seating pad or other structure  
23         containing cutout portions or otherwise designed or configured  
24         to reduce local stresses on a supported body, reduce cross  
25         contamination between a patient and the surroundings, and  
26         reduce the incidence of dust mites into the support system;

1        a bladder or membrane permeable or semi-permeable to gases  
2        or other fluids, completely encasing said mattress, cushion,  
3        seating pad or other structure;  
4              a passageway or other means to allow and control the  
5        ingress and egress of a gas or other fluid into or out of the  
6        pores and/or vacant regions within or around the materials  
7        encased by said bladder or membrane; and  
8              optionally, a pressure/vacuum pump to allow continuous  
9        variation of the fluid pressure within said bladder or  
10      membrane.

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12      13. A method for reducing the possibility of development of  
13       deleterious body lesions in a human body under conditions of  
14       continued bed confinement by;  
15              placing a mattress, cushion, seating pad or other  
16       structure, designed or configured to minimize localized stress  
17       concentrations caused by the weight of the body thereon,  
18       within a bladder or membrane impervious to gases or other  
19       fluids,  
20              completely encasing said mattress, cushion, seating pad or  
21       other structure; and  
22              varying the fluid pressure in the material as a means of  
23       controlling the resiliency of said material to the desired  
24       support level.

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26      14. A method according to claim 13 wherein the encased  
27       material comprises a mattress containing provision for

1 reduction of localized stresses in certain portions of the  
2 body being supported by the removal of portions of the  
3 mattress material in one or more selected regions.

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5 15. A method according to claim 13 wherein the encased  
6 material contains provisions for reduction of localized  
7 stresses by the removal of portions of the mattress material  
8 in one or more selected regions where the hole in the  
9 remaining material is in the shape of an upright truncated  
10 cone.

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12 16. A method according to claim 13 wherein the encased  
13 material contains provisions for reduction of localized  
14 stresses by means of cutting or slicing portions of the  
15 mattress material in one or more selected regions.

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17 17. A method according to claim 13 wherein the encased  
18 material comprises a seat cushion of suitable support  
19 material.

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21 18. A method according to claim 13 wherein the encased  
22 material comprises a seat cushion and said seat cushion  
23 contains provisions for localized relief of stress comprising  
24 one or more regions where material has been removed  
25 selectively from the seat cushion.

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1   19. A method according to claim 13 wherein one or more of the  
2   edges of the mattress, cushion, or seating pad is undercut  
3   such that the edge tapers inward toward the bottom of the  
4   mattress, cushion, or seating pad.

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6   20. A method according to claim 13 wherein said mattress,  
7   cushion, or seating pad comprises a plurality of modules,  
8   separated from one another and contained within individual  
9   fluid-tight membranes or bladders.

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11   21. A method according to claim 13 wherein said mattress,  
12   cushion, or seating pad is formed from a convoluted foam  
13   material.

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15   22. A method according to claim 13 wherein the encased  
16   material comprises a seat cushion.

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18   23. A method according to claim 13 wherein the encased  
19   material comprises a seat cushion and wherein said seat  
20   cushion contains provisions for localized relief of stress  
21   comprising one or more regions where material has been removed  
22   or omitted selectively from said seat cushion.

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